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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* VIRGIL COTOCO ARARAO, IL KWON SHIM,  
SENG GUAN CHOW and SHEILA MARIE L. ALVAREZ

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Appeal 2008-5995  
Application 10/721,916  
Technology Center 2800

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Decided: January 21, 2009

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Before KENNETH W. HAIRSTON, MAHSHID D. SAADAT,  
and R. EUGENE VARNDELL, JR., *Administrative Patent Judges*.

SAADAT, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's  
Final Rejection of claims 1-10 and 21-30. Claims 11-20 have been  
canceled. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

## STATEMENT OF THE CASE

Appellants' invention relates to semiconductor package heat spreaders formed from a unitary metallic plate (Spec. 3:23-25). As depicted in Appellants' Figure 2, the cross-sectional profile of the heat spreader in one dimension is constant and does not change in the horizontal direction perpendicular thereto. According to Appellants, this provides for highly efficient and inexpensive fabrication of the heat spreader, such as by continuous metal forming and/or extruding operations which allow a large number of such heat spreaders to be formed in a single metal stamping, continuous metal forming, and/or extruding operation from a single, unitary piece of metallic material such as a metallic Cu sheet. (Spec. 6:16-24).

Independent Claim 1 is representative and reads as follows:

1. A method for fabricating a semiconductor heat spreader, comprising:

providing a unitary metallic plate; and

forming the unitary metallic plate into:

a panel;

channel walls depending from the panel to define a channel between the channel walls and the panel for receiving a semiconductor therein;

at least two feet extending from respective channel walls for attachment to a substrate;

at least one external reversing bend; and

a cross-sectional profile of the plate that is substantially constant along at least one horizontal direction that is perpendicular to the cross-sectional profile of the plate.

The Examiner relies on the following prior art in rejecting the claims:

Hawthorne	US 6,008,991	Dec. 28, 1999
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Claims 1-10 and 21-30 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Hawthorne.

Rather than repeat the arguments here, we make reference to the Briefs and the Answer for the respective positions of Appellants and the Examiner.

### ISSUE

The issue is whether the Examiner erred in rejecting the claims under 35 U.S.C. § 102(b). The issue specifically turns on whether Hawthorne anticipates Appellants' claimed invention by disclosing the step of forming a heat spreader formed of a unitary metallic plate having "a cross-sectional profile of the plate that is substantially constant along at least one horizontal direction that is perpendicular to the cross-sectional profile of the plate," as recited in claim 1.

### FINDINGS OF FACT

1. Appellant's Specification, as shown in Figure 2, describes the heat spreader 200 as follows:

The heat spreader 200 is formed from a single metallic plate, preferably copper (Cu). As can be seen in FIG. 2, the cross-sectional profile of the heat spreader 200 in one dimension (horizontally transversely as depicted in FIG. 2) is constant and does not change in the horizontal direction perpendicular thereto, depicted by an arrow 202. This provides for highly efficient and inexpensive fabrication of the heat spreader, such as by continuous metal forming and/or extruding operations. A large number of such heat spreaders can thus be formed in a single metal stamping, continuous metal forming,

and/or extruding operation from a single, unitary piece of metallic material such as a metallic Cu sheet.

Heat spreaders, such as the heat spreader 200, that are thus formed in a single metal stamping, continuous metal forming, and/or extruding operation ("unitary metal forming") will have characteristic physical properties in the final product that are a result of such unitary forming processes.  
(Spec. 6:17-28).

2. Hawthorne in Figure 3 discloses a packaged integrated circuit device incorporating a tape with laminated dielectric and conductive leads and a heat spreader or rigid support member having alignment pins (col. 4, ll. 57-67).

3. Hawthorne's heat spreader is formed of a rigid, strong, self-supporting, thermally conductive material such as a suitable metal or a polyphenylene sulfide (PFS) (col. 5, ll. 20-23).

4. Hawthorne discloses that the heat spreader is either molded or stamped in the configuration shown, having a somewhat raised central die receiving section 68 surrounded by lateral sections 70, each of which is formed with an integral standoff pin, such as standoff pins 72a and 72b (col. 5, ll. 29-33).

## PRINCIPLES OF LAW

### *1. Scope of Claims*

The scope of the claims in patent applications is determined not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction in light of the Specification as it would be interpreted by one of ordinary skill in the art. *In re American Academy of Science Tech Center*, 367 F.3d 1359, 1364 (Fed. Cir. 2004). "[T]he words

of a claim ‘are generally given their ordinary and customary meaning.’” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). Furthermore, the specification is the single best guide to the meaning of a claim term. *Phillips v. AWH Corp.*, 415 F.3d at 1315.

## 2. Anticipation

A rejection for anticipation under section 102 requires that each and every limitation of the claimed invention be disclosed in a single prior art reference. *See In re Paulsen*, 30 F.3d 1475, 1478-79 (Fed. Cir. 1994). “Anticipation of a claim requires a finding that the claim at issue ‘reads on’ a prior art reference.” *Atlas Powder Co. v. IRECO, Inc.*, 190 F.3d 1342, 1346 (Fed. Cir. 1999) (quoting *Titanium Metals Corp. of Am. v. Banner*, 778 F.2d 775, 781 (Fed. Cir. 1985)).

## ANALYSIS

Giving the broadest reasonable interpretation in light of the Specification to the claim term without importing limitations, we find the Examiner’s interpretation (Ans. 7-8) of the claim term “substantially constant” not to be supported by factual evidence. In fact, Appellants have clearly set forth (Reply Br. 2-5) what a “substantially constant cross-sectional profile” means by pointing to page 6 of the Specification for such description. The portion of the Specification relied on by Appellants states that the cross-sectional profile in one direction does not change and provides for efficient fabrication of the heat spreader by continuous metal forming and/or extruding operations (FF 1). Following the principles set forth by the *Phillips* decision guiding us to consult the specification to give meaning to a claim term, without importing limitations from the specification,

“substantially constant” would have been understood by one of ordinary skill in the art to mean not changing in the general cross-sectional profile along the entire length of the heat spreader.

As described above, Hawthorne provides for a heat spreader that is either stamped or molded having a somewhat raised central section surrounded with flat lateral sections (FF 2-4). We disagree with the Examiner’s characterization of the heat spreader of Hawthorne as having a substantially constant cross-sectional profile along one horizontal direction that is perpendicular to the cross-sectional profile of the plate (Ans. 7). As argued by Appellants (App. Br. 15-17), the cross-sectional profile of the heat spreader in Hawthorne, while constant along a portion of its length, is not substantially constant along the entire length of the heat spreader in any direction. Specifically, the raised central die receiving section makes the profile of the heat spreader non-constant along any of the horizontal directions (FF 4).

We also disagree with the Examiner’s assertion (Ans. 6) that since Hawthorne indicates the drawings not to be to scale, except in Figure 5, the cross-sectional profile depicted in Figure 5 meets the claim language. Based on a review of Figure 5 of Hawthorne, we find that while the central die receiving section may not be raised, a cavity is formed by a central section for receiving die 44’ that is thinner than the surrounding portions. Therefore, the cross-sectional profile of the heat spreader depicted in Figure 5 of Hawthorne changes along each axis and is not substantially constant in any direction.

### CONCLUSION

On the record before us, we find that the Examiner failed to make a prima facie case that Hawthorne anticipates claim 1 or other independent claims 9, 21, and 29 which include similar limitations related to a “substantially constant” cross-sectional profile. Therefore, in view of our analysis above, we do not sustain the 35 U.S.C. § 102 rejection of claims 1, 9, 21, and 29, nor of any claims dependent thereupon, as anticipated by Hawthorne.

### DECISION

The decision of the Examiner rejecting claims 1-10 and 21-30 is reversed.

### REVERSED

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